

REMARKS/ARGUMENTS

Applicants would like to thank the Examiner for the courtesy extended to their undersigned representative during their telephone interview of December 17, 2009. During that interview, the Examiner's rejection of the non-allowed claims was discussed; no agreement was reached. The Examiner's Interview Summary dated December 30, 2009 accurately reflects the interview. Further details of the interview are provided below.

Claims 38-78 are pending herein, claims 38, 49, 70 and 77 being independent. Claims 49-74 are allowed. No amendments are made herein.

In the pending Office Action, the Examiner rejected claims 38-45, 47, 48, 75 and 77 under 35 U.S.C. § 103(a) as obvious over United States Patent No. 4,183,316 (Bennett); claim 46 under 35 U.S.C. § 103(a) as obvious over Bennett in view of United States Patent No. 6,772,705 (Leonard, *et al.*); and claims 76 and 78 under 35 U.S.C. § 103(a) as obvious over Bennett. Applicants have carefully considered the Examiner's rejections, and the reasons given in support thereof, and respectfully disagree with the conclusions reached by the Examiner. For the reasons set forth more fully below, applicants respectfully submit that the invention as claimed in claims 38-48 and 75-78 are distinct from the references applied by the Examiner. Early and favorable action is therefore solicited.

The following description of the invention is taken from the Specification, and is provided for the convenience of the Examiner. It is directed to the embodiments of the invention claimed in rejected claims 38-48 and 75-78, and is not intended to argue limitations not claimed therein, or to argue for an interpretation of any claim term used therein that is other than, or more narrow than, the broadest reasonable interpretation of such claim term as would be ascribed thereto by one of ordinary skill in the art upon a full and fair reading of the Specification.

Claims 38-48 and 75-78 are directed to an underwater buoyancy element comprising a casing and a buoyancy fluid confined in and entirely filling the casing. The buoyancy fluid has a density that is less than that of sea water, is naturally in a gaseous state at ambient atmospheric temperature and pressure, and is naturally in an entirely liquid state at the underwater depth to which the buoyancy element is submerged. Thus, the natural state (gas or liquid) of the buoyancy fluid is different depending upon whether the fluid is at sea level (where it is a gas) or submerged (where it is a liquid). In one embodiment of the invention (claims 38-48, 75 and 76) the buoyancy fluid is a quasi-incompressible fluid. Since the buoyancy fluid is naturally less dense than the surrounding water at the depth to which the object being submerged is submerged, it imparts buoyancy to the object. This combination is nowhere shown in the art applied by the Examiner.

The primary reference upon which the Examiner relies is Bennett, which discloses a variable volume depth control for use in controlling the depth to which an object is submerged. The depth control includes a sealed chamber **14** enclosing a working fluid **16**, which has a variable volume (col. 1, lines 11-13): it expands when heated and contracts when cooled (col. 3, lines 1-4). Chamber **14** is generally rigid, but includes a flexible diaphragm **18** on one side thereof so that the device has a “variable external volume” (col. 1, line 55) to accommodate the expansion and contraction of working fluid **16**. Chamber **14** further includes a battery-powered heating element **20**.

In operation, chamber **14** is attached to the object to be buoyed at a desired depth. The object is deployed at a desired location, and allowed to sink to the desired depth. When the object reaches the desired depth, a switch activates heating element **20** to heat working fluid **16** until working fluid **16** turns partly to gas and expands, thereby pushing out diaphragm **18** and imparting buoyancy to the object. Heating element **20** cycles on and off to keep working fluid **16** in the state

which would impart the buoyancy necessary to maintain the object at the desired depth. Heating element 20 continues to cycle on and off until its battery runs out, thereby allowing working fluid 16 to cool and no longer impart buoyancy to the object, permitting the object to sink.

Bennett teaches nothing about using a quasi-incompressible fluid, or any fluid naturally in a gaseous state at sea-level ambient temperature and pressure and naturally in a liquid state at the temperature and pressure at the desired depth. The Examiner concedes as much in the Office Action (page 3 of the Office Action, lines 2-8), and argues that the properties of quasi-incompressible fluids are known, as admitted by applicants in the Specification (page 3 of the Office Action, lines 8-14). The Examiner then argues that, since the properties of quasi-incompressible fluids are known, their use in the Bennett depth control would be an obvious expedient:

“[I]t would have been obvious to provide a known fluid of commonly available compounds with Bennett to create the invention as claimed by applicant[s]. The rationale would have been to utilize a fluid of predictable characteristics from common compounds of known and predictable physical and chemical properties that would ... provide the expected results of providing a reliable buoyancy fluid for the underwater buoyancy element that would be naturally in a gaseous state at ambient atmospheric temperature and pressure, and naturally in an entirely liquid state at the underwater depth to which the buoyancy element is immersed; the specific compounds and properties recited for the fluid would be considered obvious as a matter of engineering design choice depending on the specific performance characteristics and operating parameters desired for the fluid and element.”

(Page 3 of the Office Action, lines 12-22)

Essentially, therefore, the Examiner's position is that *if* one of ordinary skill in the art were to use a buoyancy fluid having the claimed properties, then the buoyancy fluid would perform as expected. During the interview, it was pointed out to the Examiner that the above analysis lacks any explanation of *why* one of ordinary skill in the art would have used a quasi-incompressible fluid, or any fluid having the claimed properties, in a buoyancy device. The Examiner replied that “*why*” means a “motivation” for making the combination, and that, pursuant to his understanding of the

Supreme Court's decision in *KSR Intl. Co. v. Teleflex, Inc.*, 82 U.S.P.Q.2d 1385 (2007), it was unnecessary for him to articulate a "motivation" for the combination, only a "rationale".

With this position, and this analysis of *KSR*, applicants respectfully disagree. It is submitted, instead, that providing some reason *why* a combination would be made by one of ordinary skill in the art is still an important part of an obviousness analysis, and is arguably the single most important part of that analysis. The Supreme Court's decision in *KSR* is not to the contrary and, in fact, supports that statement.

In *KSR*, the Court stated:

"As is clear from cases such as [*United States v. Adams*, 148 U.S.P.Q. 479 (1966)], a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. Although common sense directs one to look with care at a patent application that claims as innovation the combination of two known devices according to their established functions, ***it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.*** This is so because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known." 82 U.S.P.Q.2d at 1396 (emphasis supplied)

Thus, the Supreme Court did not abandon or disavow the need to identify the reason a combination of known elements would be made, rather, the Court *re-emphasized* the need to provide a reason *why* a combination would be made, lest *any* combination of known elements be deemed unpatentable.

The Examiner's analysis relied heavily on the allegedly "predicable" nature of the incorporation of a quasi-incompressible fluid into a buoyancy device, namely that the fluid will work as expected *once it is put in place*. Applicants do not dispute that a buoyancy fluid having the claimed properties will act as it is expected to act, but do dispute that there is any showing or

explanation in the record of a reason that would prompt one of ordinary skill in the art to make the claimed combination.

Under the Examiner's analysis, practically any mechanical device would be considered obvious, since the operation of the device would be "predictable", once it was assembled. If each component part of the device performs its known functions, even if the totality of the device were to perform a new function, the end result would be "predictable" and, according to the Examiner's rationale, obvious. This line of reasoning was expressly disavowed by the Supreme Court in *KSR* in the passage quoted above. The Court also cautioned against the use of "hindsight bias" in analyzing obviousness, 82 U.S.P.Q.2d at 1397, wherein the invention is now considered obvious simply because the inventors thought of it.

After *KSR*, the Federal Circuit has continued to recognize the importance of a finding of motivation, for example in the case of *Rentrop v. Spectranetics Corp.*, 89 U.S.P.Q.2d 1417, 1420 (Fed. Cir. 2008), the Court upheld a jury verdict of non-obviousness based upon an instruction that *required* the jury to find motivation for it to find obviousness. The Federal Circuit has made clear there must be some showing of a "reason to combine". *Fresenius USA, Inc. v. Baxter Intern., Inc.*, 92 U.S.P.Q.2d 1163, 1173 (Fed. Cir. 2009). The Examiner's analysis completely lacks a showing of any "reason to combine". A showing that the Supreme Court said in *KSR* should be "explicit". 82 U.S.P.Q.2d at 1396.

Here, the Examiner offers *no* reason why one of ordinary skill in the art would place a fluid having the claimed properties in a buoyancy device. The primary reference upon which the Examiner relies, Bennett, actually teaches away from using a quasi-incompressible fluid to maintain the buoyancy of the submerged object, by teaching that working fluid **16 expands and contracts** – the exact *opposite* of a "quasi-incompressible" fluid.

For all these reasons, therefore, it is submitted that the Examiner's analysis does not establish the obviousness of the invention as claimed in claims 38-48 and 75-78, since it fails to provide an explicit analysis of *why* one of ordinary skill in the art would deviate from the teachings of the primary reference, Bennett, and utilize a buoyancy fluid having the claimed properties. In the absence of such a showing, it is submitted that the Examiner's analysis fails to demonstrate that the invention as claimed in claims 38-48 and 75-78 is obvious in light of the applied references.

The other references applied by the Examiner do not overcome these deficiencies in the Examiner's analysis or in Bennett, nor do they teach or suggest the missing element of the invention. Withdrawal of the rejections under 35 U.S.C. § 103(a) and early and favorable action is therefore solicited.

It is believed that no additional fees or charges are required at this time in connection with the present application. However, if any fees or charges are required at this time, they may be charged to our Patent and Trademark Office Deposit Account No. 03-2412.

Respectfully submitted,
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